

## THE PROBLEM OF LEAVENWORTHIA AUREA

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TO ONE who became acquainted with *Leavenworthia* largely by seeing and studying the great profusion of these plants covering acres of cedar glades, hillsides and fields in early spring in the Central [Nashville] Basin of Tennessee,<sup>1</sup> it has been a puzzle as to why one of these lavender to white flowered species should be regularly passing under the name *Leavenworthia aurea*. True, there is a yellow-flowered form of *L. stylosa* that seems to dominate the thin-soiled areas of parts of the Central Basin but in nearly every population there are at least some lavender-flowered plants and there are often fairly extensive patches. In my experience, the reverse situation is more frequent in *L. stylosa*, so far as flower color is concerned. Most of the plants are lavender-flowered with a yellow "eye" and there is frequently present the odd yellow-flowered individual or at times patches of yellow-flowered plants. A close examination of the yellow-flowered and the lavender-flowered plants does not readily reveal correlated differences and it is easy to conclude that these are merely two color phases of a single species. Currently, *L. stylosa* is so interpreted.

On the other hand, in population after population of what has been called *L. aurea* in the Central Basin, the flower color is never yellow or even yellowish. There is some variation in color but the range is from lavender to nearly white. The most frequent color observed in three different seasons was light lavender.

In comparing the Central Basin plants with the few collections of specimens available from southeastern Oklahoma, the area from which the type of *L. aurea* came, I have been repeatedly impressed by the differences between the plants of the two areas. The impression that two distinct species were being masked by calling them the same was reinforced in the spring of 1955 when I had the opportunity of studying a large population of *L. aurea*, six miles west of Fort Towson, Oklahoma, which must be close to the type locality for the species.<sup>2</sup> Here, the plants,

<sup>1</sup> Rollins, Reed C. Some Cruciferae of the Nashville Basin, Tennessee. *RHODORA* 54: 182-192. 1952.

<sup>2</sup> Baldwin [Bull. Torr. Bot. Club 72: 373. 1945] appears to favor eastern Texas as the type locality. However, the type location cannot be there for Torrey [Ann.

all yellow-flowered, grow on thin, wet soil, overlying limestone. The habitat is not unlike that of areas in the Central Basin of Tennessee where *Leavenworthia* abounds.

In true *L. aurea*, the siliques are relatively thick, broad, and there is a definite raised margin formed by the replum, while in the Tennessee plants the siliques are thin, narrowed, and lack such a conspicuous margin. The siliques are borne on longer, thicker gynophores and the styles are much thicker in *L. aurea* than in the more easterly material. The thick leaves of *L. aurea*, each with 0–3 pairs of obtuse and scarcely dentate, lateral lobes and a rounded terminal lobe, contrast with the relatively thin leaves of the Tennessee plants, where one finds 3–6 pairs of acute, dentate, lateral lobes on each leaf and a terminal lobe that is definitely angular. The seeds of *L. aurea* are slightly more massive and the funicular cleft is broader and shallower than these same features of Central Basin material. These differences between the plants of geographically separated areas, in addition to the flower color mentioned above, surely indicate that we are in fact dealing with different taxa of specific rank. A description of the Central Basin material, together with citations of specimens for this taxon, are given below.

I had intended to include among the citations some collections from Alabama and Georgia. However, specimens from these states deviate slightly from those of Tennessee. A further study of populations of *Leavenworthia*, including the variations of both the newly proposed *L. exigua* and what is passing as *L. stylosa*, is needed. The early citations of specimens from Alabama, such as those of Peters, of Hatch, and of Buckley, as *L. aurea* both by Gray<sup>3</sup> and by Watson,<sup>4</sup> referred to material that is closer to *L. stylosa* than to *L. exigua*. I have collected what appears to be *L. stylosa* in Lawrence, Franklin, Colbert and Morgan Counties, Alabama, but the material needs further study along with additional field studies of *Leavenworthia* in Alabama and Georgia. Specimens collected by Harper and by Palmer in Jefferson County, Alabama, and by Duncan and

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Lyc. Nat. Hist. 4: 89. 1837] specifically states, "Wet places on the prairies in the vicinity of Fort Towson, Arkansas [now Oklahoma]; also in Texas, and in Jefferson County, Alabama."

<sup>3</sup> Gray, A. Bot. Gaz. 5: 25–27. 1880.

<sup>4</sup> Watson, S. Syn. Fl. N. Am. I: 152. 1895.

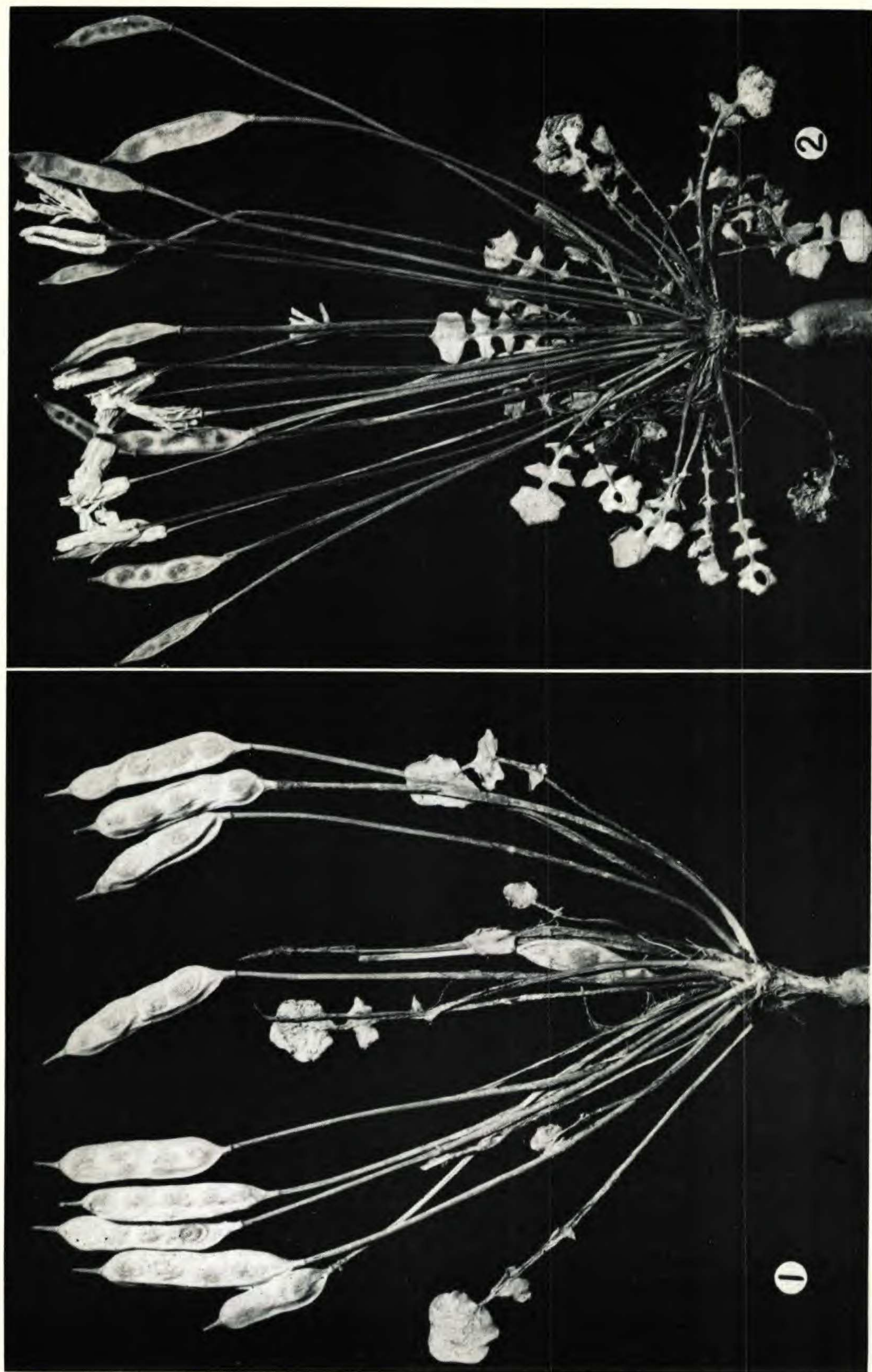


PLATE 1223. LEAVENWORTHIA. Fig. 1, *L. aurea* (Rollins 5582). Fig. 2, *L. exigua* (Rollins 5535).

McDowell in Catoosa County, Georgia, show that a careful study of *L. stylosa* throughout its range is needed. This should probably be coupled with an extensive survey of the chromosome numbers of the various populations. As Baldwin (l. c.) has suggested, *L. stylosa* is the most variable of any of the species of *Leavenworthia*. An interpretation of its relationship to *L. exigua* must remain unstated for the present. Ordinarily, *L. stylosa* and *L. exigua* are easily distinguished on flower size alone, the latter having flowers less than half the size of those of *L. stylosa*.

True *Leavenworthia aurea* appears to be confined to southeastern Oklahoma and eastern Texas. The known collections are still few in number. I have seen the following:—**Oklahoma:** vicinity of Ft. Towson, *Leavenworth* s.n. (GH, isotype); “petals lemon yellow, paler at tips and without, with radial orange streaks at base; pasture, Choctaw County, March 20, 1947, *Rogers McVaugh 7816* (GH); leaves thick and fleshy, petals lemon yellow, clear, slightly emarginate, shallow soil near Rock Creek, 6 miles west of Ft. Towson, April 13, 1955, *Reed C. Rollins 5582* (GH); bottom of depression in black clay, 6 miles northwest of Idabel, McCurtain County, April 19, 1951, *U. T. Waterfall 11825* (OKLA, TEX). **Texas:** open ground, semibarren, marly limestone, San Augustine, San Augustine County, April 1, 1918, *E. J. Palmer 13235* (MO); limestone barrens, same locality, March 28, 1915, *E. J. Palmer 7087* (MO).

***Leavenworthia exigua*** Rollins, sp. nov.

Annual; scapose except in occasional plants where the lower, usually decumbent stems are branched; leaves all basal, petiolate, lyrate-pinnatifid, 2–6 (–8) cm. long, glabrous, thin, terminal lobe angular, nearly orbicular in outline, 0.5–1 cm. broad; lateral lobes dentate, diminishing toward base, 3–6 pairs, petiole expanded at base; scapes numerous, arising in leaf-axils at crown, leafless, glabrous, erect or the outer slightly decumbent at base, 4–8 cm. long; occasional leafless, branching stems present, bearing a number of flowers on long (2–4 cm.) slender pedicels; flowers usually solitary on the scape; sepals and petals spreading on bright days, closed in reduced light; sepals oblong, 3.5–4.5 mm. long, 1.2–1.5 mm. wide, scarious margined; petals spatulate, emarginate, light lavender to nearly white, 8–10 mm. long, 3–3.5 mm. wide, widest at apex and tapering continuously to a very narrow claw; stamens strongly tetradynamous, filaments of single stamens 2–3 mm. long, curved at base, filaments of paired stamens 4–5 mm. long, straight, anthers 1–1.2 mm.